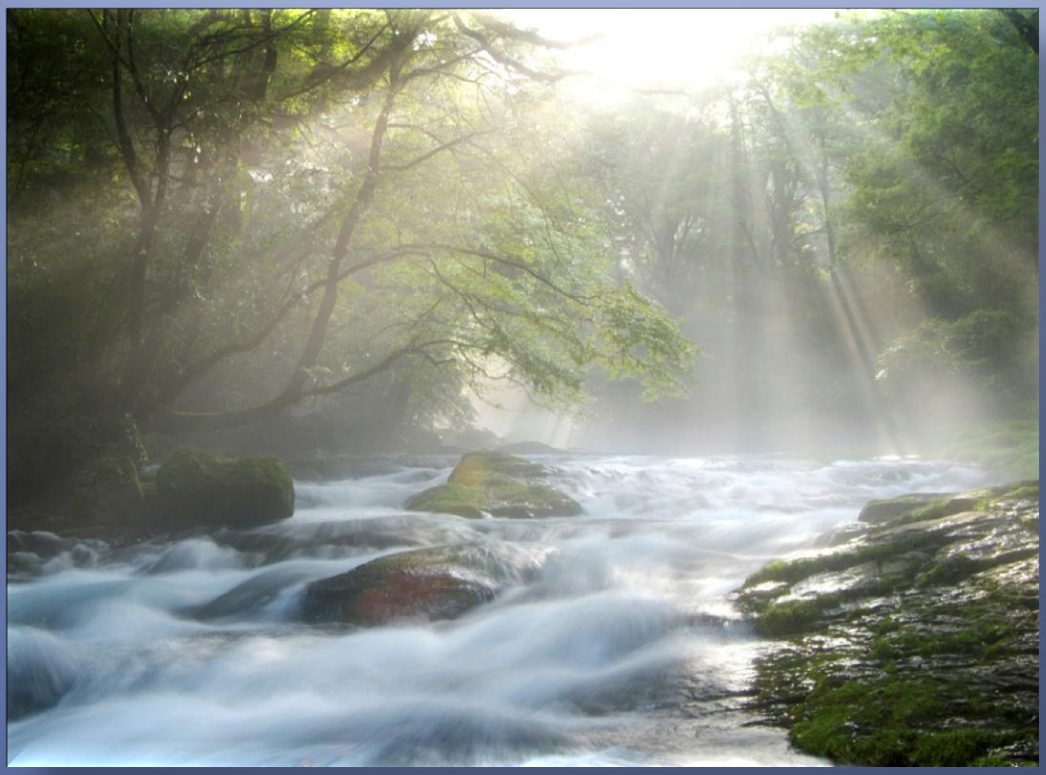

2010 BMP Implementation Survey

Mississippi's BMP Implementation Monitoring Program

The Best Management Practices Implementation Monitoring Program was developed to provide a way to measure the voluntary use of BMPs in Mississippi. The Mississippi Forestry Commission conducts the BMP Implementation Survey on a three-year cycle.

Mississippi's Voluntary Silvicultural Best Management Practices Implementation Monitoring Program

2010 BMP Implementation Survey For Mississippi

Prepared by
Mississippi Forestry Commission

February 2011

Charlie Morgan
State Forester

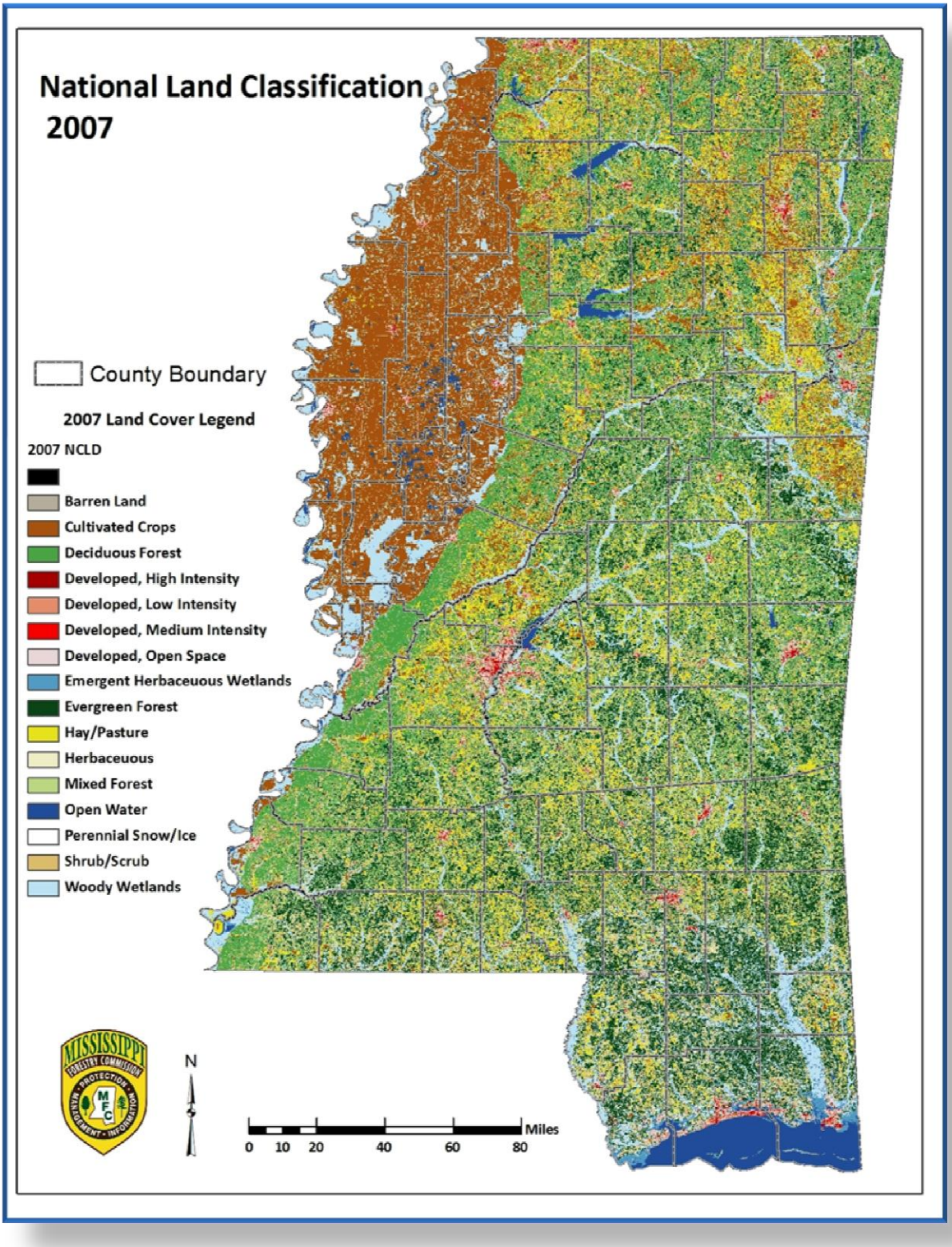

Figure 1: Forest Cover Types in Mississippi

Table of Contents

Table of Figures

Table of Tables

Executive Summary

In 2010, the Mississippi Forestry Commission conducted a field survey of best management practices (BMPs) voluntarily implemented on forestland in Mississippi. This report presents the results of that survey.

The guidelines set forth in "Silvicultural Best Management Practices Implementation Monitoring: A Framework for State Forestry Agencies" was used to develop the 2010 BMP Implementation Survey for Mississippi.

A total of 237 sites in 80 counties located in 10 watersheds in Mississippi having recent silvicultural activity were randomly selected to evaluate the voluntary implementation of best management practices. The Mississippi Forestry Commission utilized its own personnel to conduct the survey.

The following criteria were applied in selecting sites to be included in the survey:

- Forest harvesting activities occurring within 24 months.
- Sites must be at least 10 acres in size.
- Sites were selected without regard to ownership.

The 2010 BMP Implementation Survey results for Mississippi revealed that 93 percent of best management practices applicable to the survey sites were implemented in accordance with the guidelines published in the handbook *Mississippi's BMP – Best Management Practices for Forestry in Mississippi.* Figure 1 shows the BMP categories evaluated during the survey and the implementation results for each category.

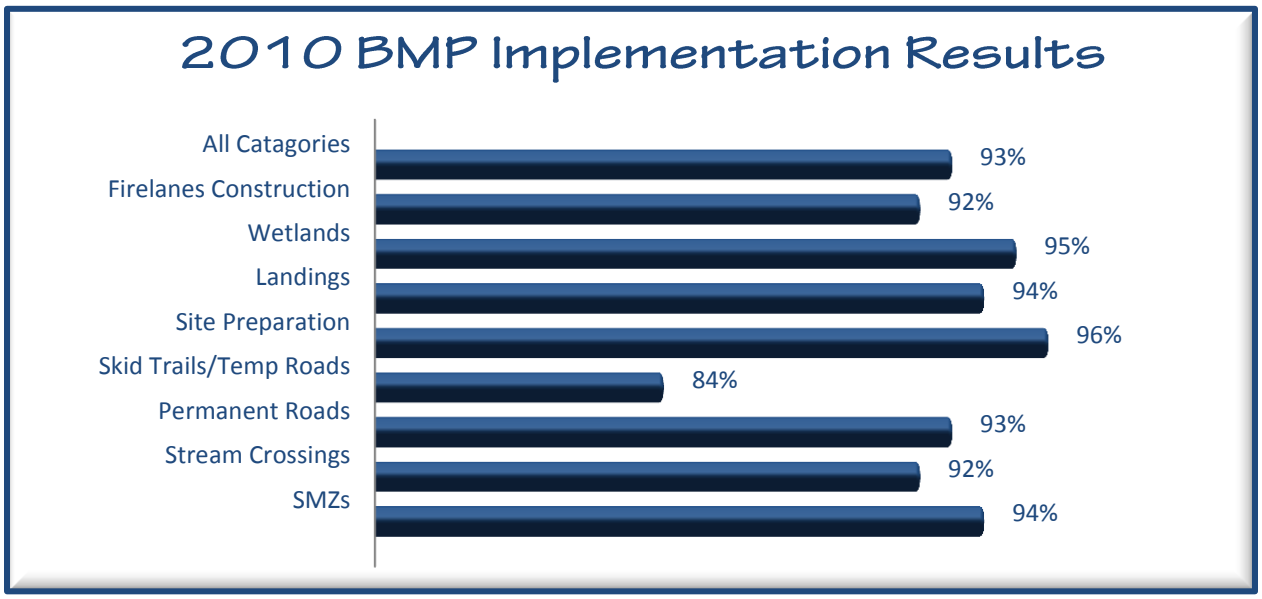

Figure 2: 2010 BMP Implementation Results

Introduction

Mississippi has nearly 20 million acres of forestland, covering two-thirds of the state's total land area. Forests make an important contribution to Mississippian's quality of life by providing jobs, forest products, livestock forage areas, wildlife habitat, scenic areas, recreational experiences, clean air, clean water, and many other social, economic, and health benefits.

Figure 3: Chunky River in Newton County, Mississippi

The Clean Water Act of 1987 required that proper steps be taken to prevent water pollution. Mississippi's Silvicultural Best Management Practices (BMPs) were established as a result of the Clean Water Act of 1987. Best Management Practices are non-regulated, voluntary guidelines for silvicultural activities that, when properly applied will protect water quality from non-point source pollutants while maintaining site productivity. Non-point source pollution is defined in Section 319 of the Clean Water Act of 1987 as "pollution caused by diffuse sources that are not regulated as point sources and normally associated with agricultural, *silvicultural* [emphasis added], urban runoff, and runoff from construction activities, etc. Such pollution results in human-made or human-induced alteration of the chemical, physical, biological, and radiological integrity of the water."

The Best Management Practices Implementation Monitoring Program was developed to provide a way to measure the voluntary use of BMPs in Mississippi. The program began in 1988 when the Department of Environmental Quality requested that the Mississippi Forestry Commission coordinate the development of voluntary best management practices for forestry in Mississippi. The Mississippi Forestry Commission worked with the Mississippi Forestry Association to put together a group of individuals representing a cross section of the forestry community to develop the guidelines. This group included landowners, loggers, forest industry, professional foresters, and the Department of Environmental Quality. Suggestions and comments from other states were also considered in the development of Mississippi's silvicultural BMPs.

The BMP guidelines were approved by the Mississippi Department of Environmental Quality and the Environmental Protection Agency and in 1989, published in the handbook *Mississippi's BMPs – Best Management Practices for Forestry in Mississippi.* The handbook was revised in 1995, 2000 and 2008.

2010 BMP Implementation Survey Procedure

Sampling Method

The 2010 BMP Implementation Survey is a statewide survey designed to assess statewide BMP compliance and not individual basin BMP compliance. Therefore, all results contained in this report are statewide results only.

The number of sites to be evaluated was determined from 2009 severance tax information. Based upon the severance tax information 237 sites were required to be evaluated in 80 counties.

Sites selected were randomly chosen from aerial reconnaissance. The latitude and longitude of each site was determined using the aircrafts onboard navigation system. The number of sites identified from the air exceeded the required number of sites to be evaluated. This would insure that if a site did not meet requirements or was inaccessible from the ground there would be enough sites identified to meet the 237 site requirement.

Eligible Survey Sites

Site selection criteria used for the 2010 survey were: (1) sites must have had some type of forest harvesting activity, either regeneration harvest or thinning, within a period of two years prior to the survey, (2) sites must be at least 10 acres in size, and (3) sites were selected without regard to ownership. The ownership of a site was determined after the site had been selected. This allowed for an unbiased selection and distribution of survey sites in regard to ownership.

Survey Site Evaluation

For each site surveyed by a Commission forester 73 values were collected on each of the 8 BMP categories. The BMP categories are as follows:

- Streamside Management Zone (SMZ)
- Stream Crossings
- Permanent Roads
- Skid Trails/Temporary (Secondary) roads
- Site Preparation Activities
- Landings
- Wetlands
- Fireline Construction

If a value within a category did not apply to the survey site, it was recorded as Not Applicable (N/A). All other practices were considered applicable to the site and were evaluated on whether or not they were implemented as specified in Mississippi's BMP handbook. This method of evaluation allowed each BMP category and, ultimately, the overall BMP implementation program, to be evaluated and the results expressed as a percent of applicable BMPs implemented.

The presence of a significant risk to water quality was noted for each best management practice evaluated. The forester evaluating the site used the following standard to determine the presence of a significant risk to water quality: Significant risk to water quality exists, if during a normal rainfall, sediment is likely to be delivered to a permanent water body. The presence of a significant risk did not mean that water quality was impaired on the site.

All information recorded for each BMP was based on observations made at the time of the inspection. The evaluation process did not include any assumptions concerning future activities on the site.

2010 BMP Implementation Survey Results

The 2010 BMP Implementation Survey revealed that 93 percent of best management practices applicable to the survey were implemented.

A total of 237 sites having recent silvicultural activity were randomly selected to evaluate the voluntary implementation of best management practices. A compilation of all survey data collected is found on the BMP Monitoring Inspection Form – State Totals (see pages 12-14).

General Tract Information

Silvicultural Activity

A regeneration harvest had occurred on 202 sites (85.23%) of the 237 sites surveyed. The remaining 14.77 percent of the sites involved thinning operations. Of the sites that had received a regeneration harvest, 70 had been artificially regenerated.

Tract Summary

The sites ranged in size from 10 acres to over 161 acres. Figure 2 shows the distribution of survey sites by tract size.

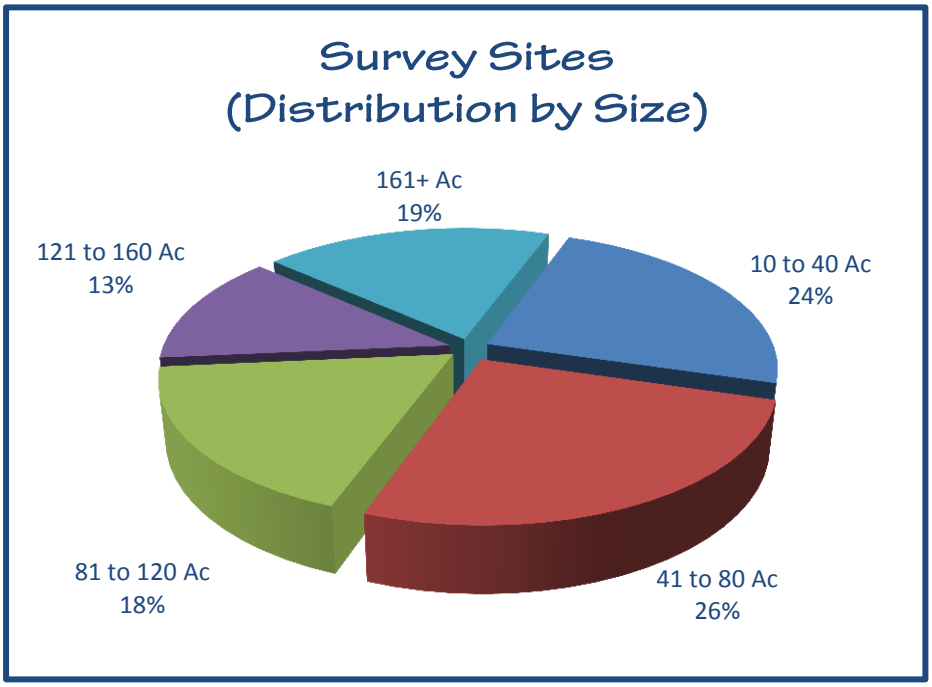

Figure 4: Distribution of survey sites by tract size

Ownership Summary

The survey sites were distributed and selected without regard to ownership in order to ensure an unbiased sample. Ownership was determined after a site was located. Figure 5 shows the distribution of survey sites in regard to ownership classes.

The 237 survey sites were in the following four forest ownership groups:

Private Nonindustrial –
(164 survey sites, 69 percent of survey)

State/Public –
(28 Survey sites, 12 percent of survey)

Federal –
(4 survey sites, 2 percent of survey)

Forest Industry –
(41 survey sites, 17 percent of survey)

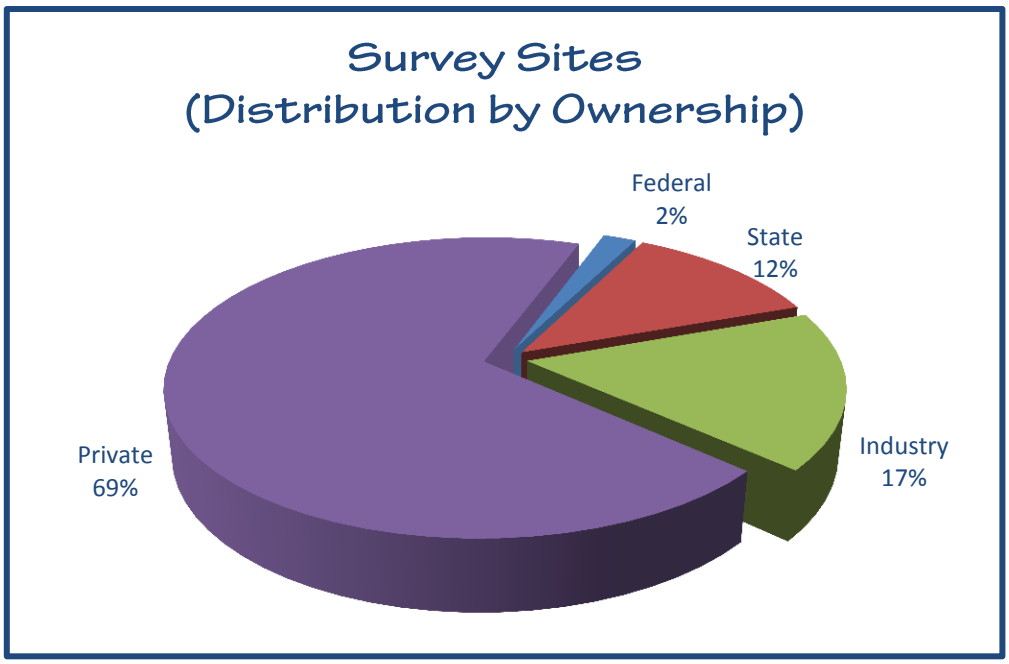

Figure 5: Survey Sites - Distribution by ownership

Counties

The BMP survey sites were randomly distributed across the state based on the potential need for BMPs. Survey sites were located in 80 of the 82 Mississippi counties. See Table 2 BMP Survey Sites by County, page 15.

River Basins

For each site inspected for BMP monitoring, the river basin containing the site was identified. Survey sites were located in 10 of Mississippi's 11 river basins as delineated in the Mississippi Department of Environmental Quality's Basin Management Program. No survey sites were located in the Lower Mississippi River basin. The river basins of Mississippi are shown below in Figure 6.

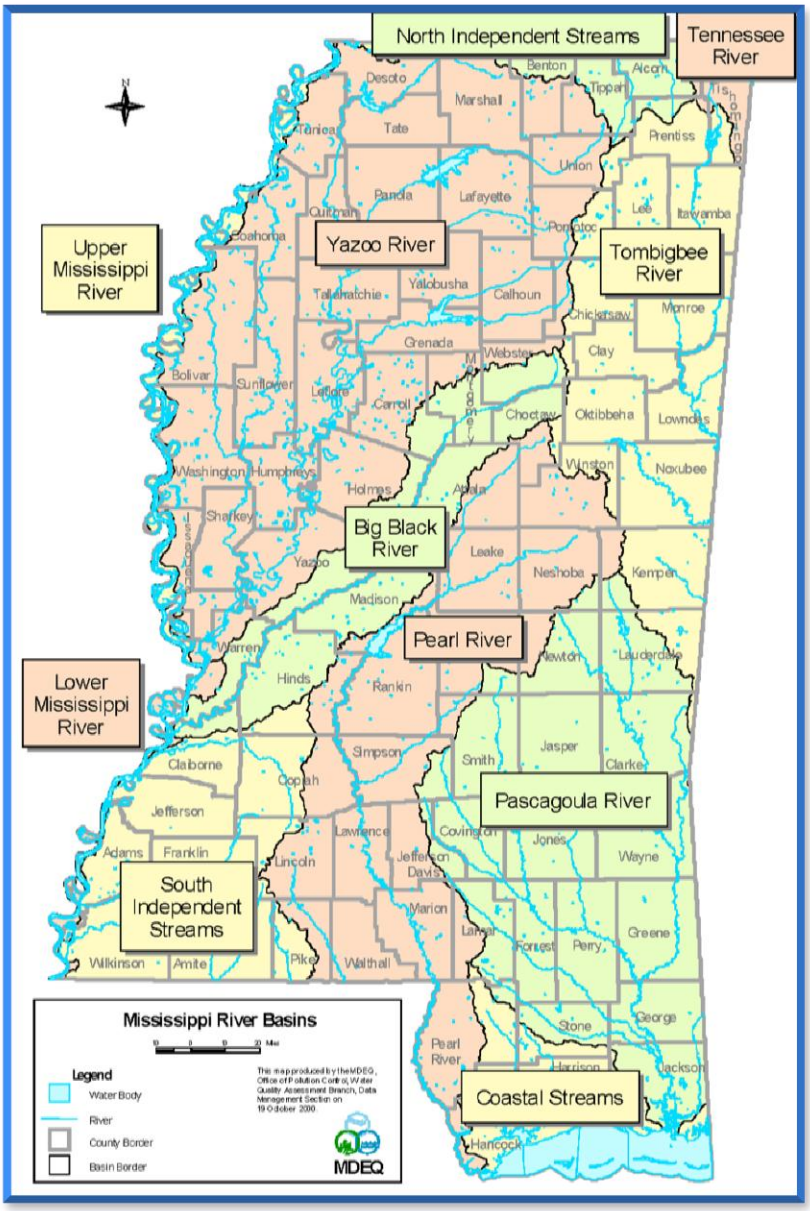

Figure 6: Mississippi River Basins

Survey Sites with Applicable BMPs by Categories

The number of survey sites on which BMP categories were applicable is shown in Figure 7. (This information is also found in Table 3, page 16)

The BMP categories Landings, Skid Trails/Temp Roads and Permanent Roads were applicable on more survey sites than other categories. The Landing category was applicable on 237 (100%) of the 237 sites. The Skid Trails/Temporary Road category was applicable on 237 (100%) and Permanent Roads on 217 (91.56%) of the survey sites.

The Streamside Management Zones category was applicable on 164 (69.20%) of the 237 sites survey while Steam Crossing applied on 136 (57.38%) sites.

The three remaining categories (Site Preparation, Wetlands and Fireline Construction) applied less frequently than any of the preceding categories. Site Preparation applied on 111 (46.84%) of the 237 survey sites, Wetlands applied on 102 (43.04%) and Fireline Constructions on 58 (24.47%) sites.

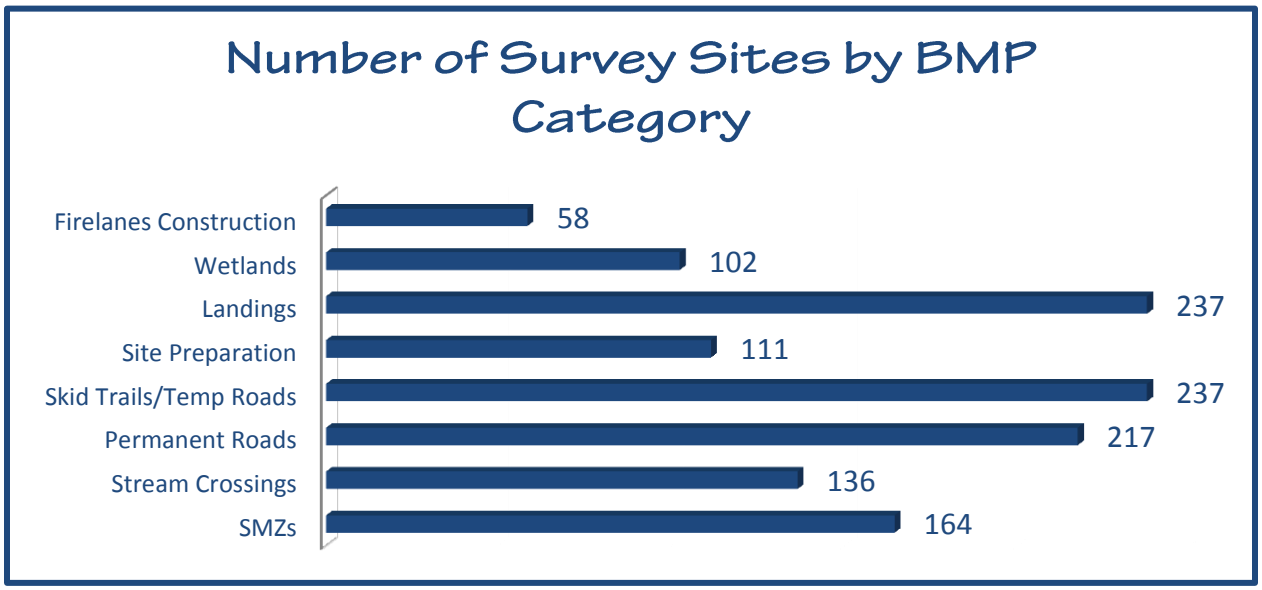

Figure 7: Number of Survey Sites for each BMP category

BMP Implementation

Applicable BMPs were evaluated on whether or not they were implemented as specified in the Mississippi's BMP handbook. Results showed that ninety-three percent of best management practices were implemented on survey sites where they were applicable (see Table 3, page 16).

Implementation results were also evaluated by BMP category. Figure 8 shows the implementation results for each BMP category. The number and percent of all applicable BMPs implemented for each category is presented in Table 3, page 16.

The lowest percentage of BMPs implemented was found in Skid Trails/Temporary Road category with 84.49% of the 1,109 applicable practices implemented as specified. Of the 2,229 practices in the Permanent Roads category, 93.58% were implemented as specified and 94.84% of the 1,124 practices in the Landing category were implemented as specified.

The Streamside Management Zones category had 94.22% of the 1,505 applicable practices implemented as specified and the Stream Crossings category had 94.18% of the 587 applicable practices implemented as specified.

Applicable BMP practices in the Site Preparation category had the highest percentage implemented as specified with 96.26% of the 721 applicable practices implemented according to specifications. Of the 287 applicable practices in the Wetlands category, 94.43% were implemented and 92.45% of the 318 practices in the Fireline Construction were implemented as specified.

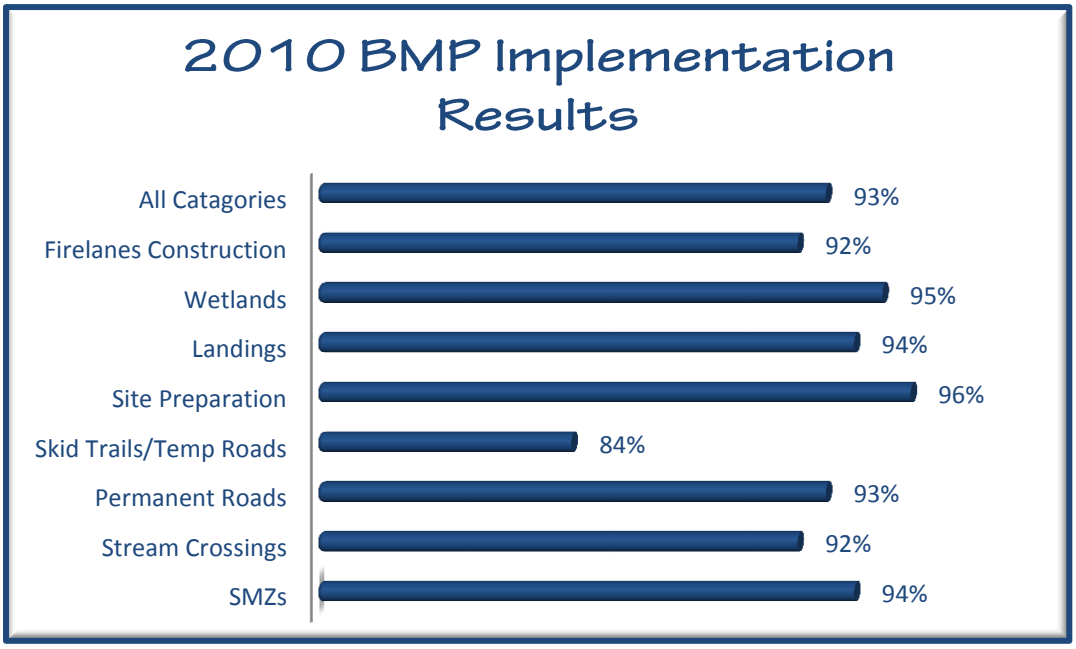

Figure 8: 2010 BMP Implementation Results

Significant Risk to Water Quality

Sites were evaluated for a significant risk to water quality each time a best management practice was determined to be applicable to the survey site. Of the 7,800 applicable BMPs evaluated, a significant risk to water quality was observed 12 times. These occurred on 12 of the 237 site surveyed. A complete listing of significant risks by individual best management practice is found on the BMP Monitoring Inspection Form – State Totals (see pages 12-14). A summary of significant risk by BMP category is given on Table 4, page 16.

No significant risks to water quality were observed in relations to BMPs associated with Fireline Constructions. One significant risk for each category was observed in relations to BMPs associated with Stream Crossing, Landing and Wetlands. Two significant risks were observed in each of following Streamside Management Zone, Site Preparation and Permanent Road categories.

The highest significant risk to water quality, with three risks was observed in the Skid Trails/Temporary Road category. The majority of these risks were associated with the *practices Skid Trail Grades (Steepness) below 15 percent*.

Comparison of 2003, 2007 and 2010 Survey

The 2010 survey results matched the 2007 results and exceed the 2003 survey results in all categories. Skid Trails/Temporary Roads remain the category with the lowest evaluation in 2007 and 2010. The category with the highest improvement was Streamside Management Zones. It improved by 3 percent over the 2007 survey and 4 percent over the 2003 survey. Figure 9 shows comparison between the 2003, 2007 and 2010 survey.

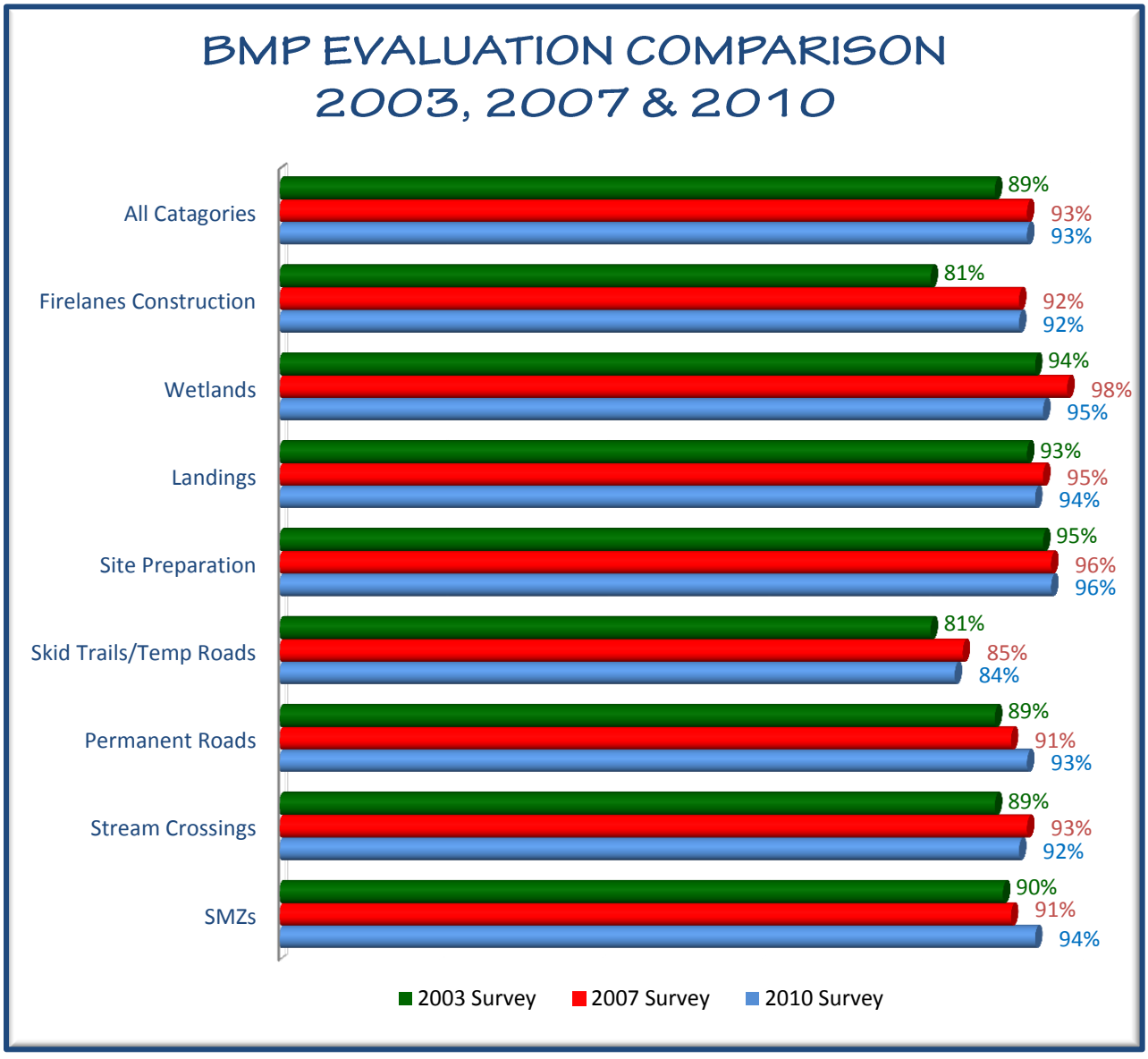

Figure 9: BMP Evaluation Comparison 2003, 2007 and 2010

Conclusion

Our forests play an essential role in the protection of water quality. They absorb rainfall, filter pollutants and recharge underground water supplies. Forests produce much of the clean water we need for recreation and support of fish and wildlife habitats as well as the drinking water supply for millions of Americans.

Despite the tremendous contribution our forest and forestry make to water quality, forestry activities have the potential to adversely impact our water locally. Voluntary best management practices are utilized in Mississippi to address this potential and help ensure water quality is protected. Studies have shown that BMP efforts work when applied in a landowner's property. The Mississippi Forestry Commission's 2010 BMP's Implementation Survey for Mississippi was conducted to assess the implementation of the voluntary BMPs in the state.

It is essential that the forestry community continue its efforts to protect water quality and monitor protection efforts. The Mississippi Forestry Commission, Southern Group of State Foresters and National Association of State Foresters are committed to the protection of our forests and water and to the routine assessment of protection measures implemented by the forestry community.

Mississippi's BMPs

BEST MANAGEMENT PRACTICES
FOR FORESTRY IN MISSISSIPPI

Appendix

Table 1: BMP Monitoring Inspection Form – State Totals

1. General Tract Information

Silvicultural Activity: Regeneration Cut 202 Thinning 35

Estimated Tract Size: 10 - 40 58 41 - 80 61 81 – 120 42 121 – 160 30 161 or more 46

Ownership Group: PNIF 164 State 28 Federal 4 Industry 41

Mississippi River Basin:

Big Black River Basin	13
Coastal Streams Basin	7
Lower Mississippi River Basin	0
North Independent Streams Basin	9
Pascagoula River Basin	47
Pearl River Basin	35
South Independent Streams Basin	25
Tennessee River Basin	3
Tombigbee River Basin	36
Upper Mississippi River Basin	6
Yazoo River Basin	56

2. Site Characteristics

Estimate Slopes Percent: 0% - 5% 92 6% - 20% 90 21% - 40% 49 Over 40% 6

Predominant Soil Texture: Clay 32 Clay Loam 67 Loam 14 Sandy Loam 109
Sand 0 Silty Soil 15

Erodibility Hazards: Low 89 Medium 115 High 33

Type of Stream Present: Perennial Stream 69 Intermittent Stream 57
Ephemeral Stream 49 N/A 62

Estimate Distance to Nearest Permanent Water Body (feet):
300 or less 71 301 – 800 36 801 – 1600 46 1601 or More 84

Evidence of Spills or Fuels on Site: Yes 7 No 230

Trash, Oil Cans, Hoses or Other Containers Left On Site: Yes 222 No 15

Has Tract Been Regenerated artificially? Yes 70 No 134 N/A 33

3. Streamside Management Zones:

	N/A	Yes	No	Sig. Risk
SMZ width established according to BMP spec	82	142	12	0
Harvesting/thinning within SMZ according to BMP spec	97	128	12	0
SMZ integrity honored (no chem., fert, burning, log decks, etc.)	82	150	5	0
Stream course clear of logging debris	82	145	10	0
SMZ free of roads and landings	82	144	11	0
Streams free of sediment due to silvicultural activity	81	147	9	0
Rutting through streams or drains avoided	84	147	6	0
Prescribed burning avoided	111	121	5	0
Blocking the natural flow of water avoided	79	146	12	1
Stream bank integrity honored	85	148	4	1
Section Totals		**1,418**	**86**	**2**
% Compliance	**94.22**			

4.	***Steam Crossings***	***N/A***	**Yes**	**No**	**Sig. Risk**
	Ditches that dump in streams avoided	105	120	12	0
	Stream crossings properly installed	126	99	12	0
	Number of stream crossings minimized	121	113	3	0
	Stream or drain crossing installed at right angle only	121	101	15	1
	Stream crossing stabilized during use	125	104	8	0
	Section Totals		537	50	1
	% Compliance	**91.48**			
5.	***Permanent Roads***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Roads respect sensitive areas	39	193	5	0
	Rutting depth does not exceed six inches for more than fifty feet	23	197	17	0
	Roads located where side drainage can be achieved	8	201	10	0
	Roads wide enough to achieve surface drying	20	212	5	0
	Roads reshaped and/or stabilized	25	174	37	1
	Roads meet grade specifications	25	199	13	0
	Roads are well drained with appropriate structures	46	167	24	0
	Side ditches do not dump into streams	44	190	3	0
	Flat no grade roads avoided	31	187	19	0
	Streambeds, rocky places and steep slopes avoided	53	174	3	0
	Potential problem soils avoided	38	192	7	0
	Section Totals		2,086	143	1
	% Compliance	**93.58**			
6.	***Skid Trails/Temporary (secondary) Roads***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Sensitive area respected	27	204	6	1
	Majority of skid trails grades (steepness) below 15%	3	204	30	2
	Rutting does not exceed six inches for more than fifty feet	1	216	20	0
	Water bars, turnouts, and other water control structures present	34	138	63	0
	Roads and skid trails are stabilized	9	175	53	0
	Section Totals		937	172	3
	% Compliance	**84.4**			
7.	***Site Preparation***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Sensitive area respected	138	96	3	0
	Contour followed	155	80	3	0
	SMZ integrity honored (no chem., fert, burning, log decks, etc.)	150	83	4	0
	Soil disturbance kept to a minimum	134	98	5	1
	Excessive soil compaction avoided	136	98	3	0
	Does it appear that chemicals were used according to label spec	153	82	2	0
	Disturbance on slopes minimized	143	93	1	0
	Water diverted from site preparation area to vegetated surface	148	85	4	1
	Extremely hot burns avoided	158	77	2	0
	Section Totals		694	27	2
	% Compliance	**95.25**			
8.	***Landings***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Location outside of SMZ	35	201	0	0
	Well-drained location	3	230	4	0
	Number and size minimized	1	234	2	0
	Sensitive areas respected	18	215	4	1
	Restored stabilized	3	186	48	0
	Section Totals		1,066	58	1
	% Compliance	**94.84**			

9.	***Wetlands***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Hydrology of site unaltered	136	99	1	1
	Roads, drainage structures applied properly	144	85	8	0
	Mandatory BMP's followed	143	87	7	0
	Section Totals		271	16	1
	% Compliance	**94.42**			

10.	***Fireline Construction***	**N/A**	**Yes**	**No**	**Sig. Risk**
	Firebreak erosion controlled	188	46	3	0
	Majority of fireline constructed around slopes or grades of less than 10%	189	45	3	0
	Water bars, turnouts, and other water control structures properly installed	186	41	10	0
	Diversion ditches not constructed at head of a drain	189	45	3	0
	Firelines not constructed down the slope of natural gully	194	42	1	0
	SMZs left between the fireline and stream	199	36	2	0
	Avoid constructing firelines into an SMZ	195	39	2	0
	Section Totals		294	24	0
	% Compliance	**92.45**			

11.	***Follow Up Questions***	**N/A**	**Yes**	**No**
	Was activity supervised by professional forester?	127	89	3
	Was landowner familiar with BMP Handbook?	133	84	20
	Was logger familiar with BMPs?	132	86	8
	Were BMPs included in contract?	153	71	13
	Has logger completed Logger Educational Training course?	165	64	8
	Are recommendations planned for landowner, if needed?	144	56	25
	Section Totals		460	77
	% Compliance	**85.66**		

State Compliance % **93**

Table 2: BMP 2010 Monitoring Sites by County

County	Survey Sites	County	Survey Sites	County	Survey Sites
Adams	3	Itawamba	3	Pike	3
Alcorn	3	Jackson	3	Pontotoc	3
Amite	3	Jasper	3	Prentiss	3
Attala	3	Jefferson	3	Quitman	2
Benton	3	Jefferson Davis	3	Rankin	3
Bolivar	1	Jones	3	Scott	3
Calhoun	3	Kemper	3	Sharkey	3
Carroll	3	Lafayette	3	Simpson	3
Chickasaw	3	Lamar	3	Smith	3
Choctaw	3	Lauderdale	3	Stone	3
Claiborne	3	Lawrence	3	Sunflower	0
Clarke	3	Leake	3	Tallahatchie	3
Clay	3	Lee	3	Tate	3
Coahoma	3	Leflore	3	Tippah	3
Copiah	3	Lincoln	3	Tishomingo	3
Covington	3	Lowndes	3	Tunica	3
DeSoto	3	Madison	3	Union	3
Forrest	3	Marion	3	Walthall	3
Franklin	3	Marshall	3	Warren	3
George	3	Monroe	3	Washington	3
Greene	3	Montgomery	3	Wayne	3
Grenada	3	Neshoba	3	Webster	3
Hancock	3	Newton	3	Wilkinson	3
Harrison	3	Noxubee	3	Winston	3
Hinds	3	Oktibbeha	3	Yalobusha	3
Holmes	3	Panola	3	Yazoo	3
Humphreys	0	Pearl River	3		
Issaquena	3	Perry	3	Total	237

Table 3: Applicable BMPs Implemented by Category

BMP Category	Number of Survey Sites	Total Applicable Practices	BMPs Implemented	
			Number	*Percent*
Streamside Management Zones	164	1,505	1,418	94.22
Stream Crossing	136	587	537	91.48
Permanent Roads	217	2,229	2,086	93.58
Skid Trails/Temporary Roads	237	1,109	937	84.49
Site Preparation	111	721	694	96.25
Landings	237	1,124	1,066	94.84
Wetlands	102	287	271	94.42
Fireline Construction	58	318	294	92.45
State Totals	**------**	**7,880**	**7,303**	**92.68**

Table 4: BMP Categories with Significant Risks to Water Quality

BMP Category	Number	Percent
Streamside Management Zones	2	18.18
Stream Crossing	1	9.09
Permanent Roads	2	18.18
Skid Trails/Temporary Roads	3	27.28
Site Preparation	2	9.09
Landings	1	9.09
Wetlands	1	9.09
Fireline Construction	0	0.00
State Totals	**12**	**100.00**

This publication was financed in part through a grant from the Mississippi Department of Environmental Quality under the provisions of Section 319 of the Federal Water Pollution Control Act, as amended.

The Mississippi Forestry Commission provides equal employment opportunity and services to all individuals regardless of disability, race, age, religion, color, gender, creed, nation origin or political affiliation. This institution is an equal opportunity provider.

Mississippi Forestry Commission
660 North Street, Suite 300
Jackson, Mississippi 39202
www.mfc.ms.gov